

3

Exploring associations between student background and performance

This chapter uses background information about students collected by the International Association for the Evaluation of Educational Achievement (IEA) Trends in International Mathematics and Science Study (TIMSS) and the OECD Programme for International Student Assessment (PISA) assessments to explore how factors associated with a student's background might be associated with their performance in Grades 4, 8 and at 15 years of age in Türkiye. Background factors analysed include a student's socio-economic background, the language they speak at home, their gender and participation in early childhood education and care (ECEC).

This chapter explores associations between students' individual characteristics, such as their socio-economic background and gender, and Türkiye's performance on the international assessments, IEA TIMSS and OECD PISA.

Box 3.1. What the data tell us

- There is great heterogeneity in students' socio-economic background in Türkiye. The variation in students' socio-economic background in Türkiye across both PISA and TIMSS are among the highest of all OECD- and TIMSS-participating countries.
- According to TIMSS 2019, over a quarter (26.3%) of children in Grade 4 and over a third of students in Grade 8 (31.8%) and, according to PISA 2018, a third of 15-year-olds (34.0%) are from disadvantaged backgrounds. This makes achieving high and equitable outcomes an inherently greater challenge than in countries where students come from more advantaged socio-economic backgrounds and there is less variation in socio-economic background on average.
- In TIMSS Grade 4,¹ the differences in performance between students of high and low socio-economic backgrounds is the highest of all OECD-participating countries (174.62 points in mathematics). This difference falls by just over 10 score points by Grade 8. Differences in performance related to not speaking Turkish at home also decline through schooling.
- Türkiye has been able to bring previously out-of-school students into school – many of whom were likely from disadvantaged backgrounds – while raising the average performance of disadvantaged students overall. In Türkiye, the average performance among disadvantaged 15-year-olds in mathematics increased by 32 points between 2003 and 2012.
- Participation in ECEC in Türkiye has increased in recent decades but the data from PISA and TIMSS, which provide information about ECEC participation five years ago (TIMSS 2019) and ten years ago (PISA 2018), show that at these times, participation was strongly related to the socio-economic background of students. Advantaged students tended to participate more and for longer compared to disadvantaged students: according to TIMSS 2019, almost 60% of children with many resources attended ECEC for 2 or 3 years compared to less than 5% of children with few resources.
- While ECEC attendance was positively associated with students' performance later in life, in Türkiye, as in all countries, this association becomes weaker after students' socio-economic background has been accounted for. In Türkiye, ECEC attendance was positively associated with reading performance only when children attended ECEC for one year in PISA 2018 and one and two years in TIMSS 2019.

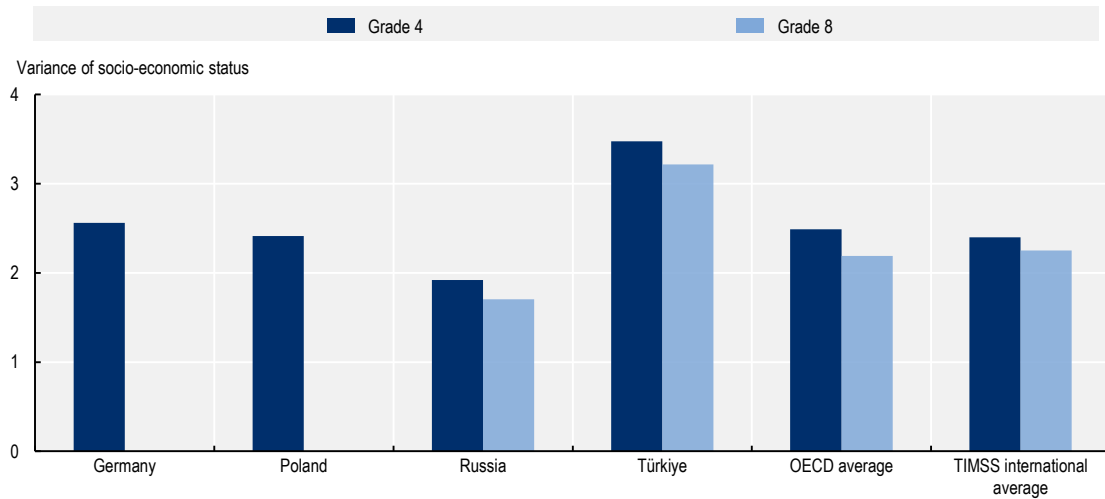
Socio-economic status

Socio-economic status of students in Türkiye

Evidence shows that, across all countries, students' socio-economic background is positively associated with learning and educational outcomes (OECD, 2019_[1]). This means that an understanding of the socio-economic status of students in Türkiye is important when looking at the country's results. Both PISA and TIMSS collect information about the degree of variation in students' socio-economic background within countries. In countries where variation in socio-economic background is higher, this means that there is more heterogeneity in students' backgrounds. According to PISA and TIMSS, the variation in students' socio-economic background in Türkiye is among the highest of all PISA- and TIMSS-participating countries

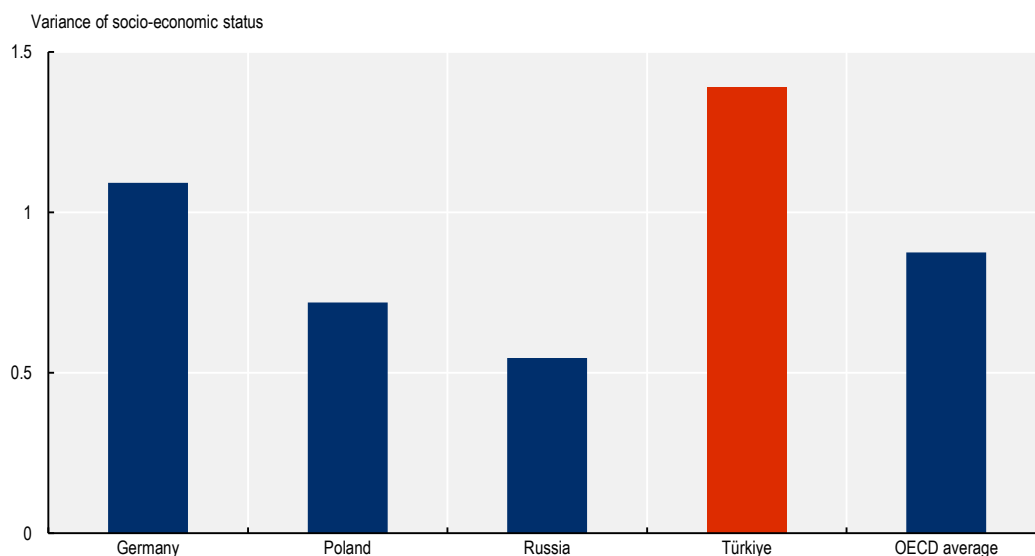
(Figures 3.1 and 3.2). Having a student population with very heterogeneous backgrounds makes achieving equitable outcomes an inherently greater challenge than in countries where student background is more homogenous. Inequities across the full cohort of 15-year-olds in Türkiye might be even higher than the PISA data suggest since, in 2018, the assessment only covered 73% of the cohort (OECD, 2019^[21]).

Figure 3.1. Variation in socio-economic background, TIMSS 2019



Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

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Figure 3.2. Variation in socio-economic background, PISA 2018

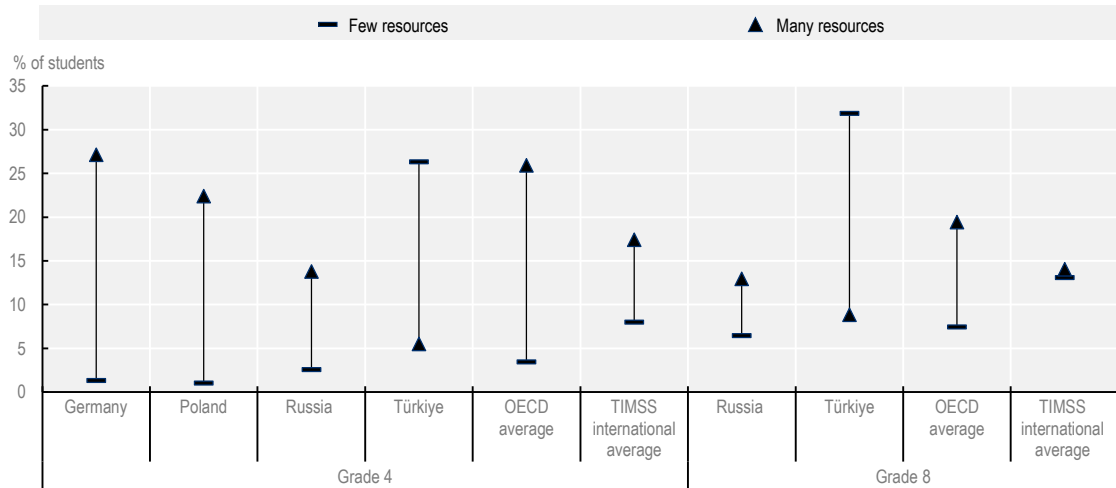
Note: The figure refers to the total variation in student PISA index of economic, social and cultural status (ESCS) which is equal to the square of the standard deviation of ESCS within each country/economy.

Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

StatLi <https://stat.link/cqowk6>

According to the TIMSS scales of home resources (Box 3.2), in Grade 4, the share of students in Türkiye with “few resources” at home is over 7 times greater than the average of OECD-participating countries and over 4 times greater in Grade 8 (Figure 3.3). According to the PISA index of ESCS (Box 3.2), the share of 15-year-olds in Türkiye from the bottom international decile of the ESCS index is six times greater than the OECD average (Figure 3.4).

Figure 3.3. Share of students with “few” and “many” resources in Grades 4 and 8, TIMSS 2019



Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).


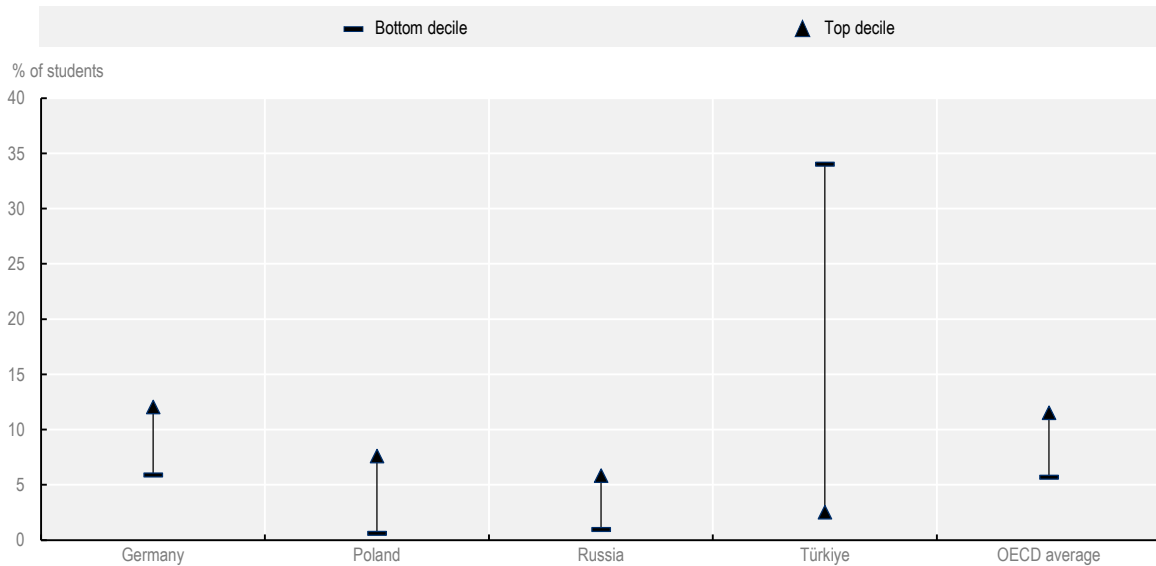

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Figure 3.4. Share of students by international decile of socio-economic status, PISA 2018



Source: OECD (2021^[4]), “PISA: Programme for International Student Assessment”, <https://dx.doi.org/10.1787/data-00365-en>.

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Since socio-economic background is positively associated with performance across PISA and TIMSS, the higher share of disadvantaged students makes it more challenging to achieve high levels of average student performance in Türkiye than in countries where socio-economic background is higher overall, and heterogeneity in terms of socio-economic background across the student population is smaller.

Box 3.2. Measuring students' socio-economic background in PISA and TIMSS

The PISA and TIMSS assessments have both developed indices that draw on multiple sources of information about student background to provide a measure of socio-economic background. Since there are differences across the scales, they are not directly comparable.

PISA index of economic, social and cultural status

In PISA, a student's socio-economic status is estimated by the PISA index of ESCS, a composite measure that combines into a single score the financial, social, cultural and human-capital resources available to students. It is based on several variables related to students' family background – parents' education, parents' occupations and an index summarising a number of home possessions that can be taken as proxies for material wealth or cultural capital, such as possession of a car, the existence of a quiet room to work, access to the Internet, the number of books, having a computer or a tablet, having a study desk and other educational resources available in the home (OECD, 2019^[11]).

TIMSS index of home resources

TIMSS 2019 developed a new scale about home resources to provide further insights into the relationship between students' socio-economic environment and their educational achievement. The scale draws on information from both students and parents and is slightly different in Grades 4 and 8:

- **Home Resources for Learning scale, Grade 4** – Students are scored according to their own and their parents' reports regarding the availability of five resources: number of books at home; number of children's books at home; home study supports (e.g. Internet connection, computer, study desk and own room); parent education; and parent occupation.
- **Home Education Resources scale, Grade 8** – Students are scored according to their reports regarding the availability of three resources: number of books at home; home study supports (e.g. Internet connection, computer, study desk and own room); and parent education.

In both grades, the scale is divided into three categories: students with many resources, students with some resources and students with few resources (Mullis et al., 2020^[5]).

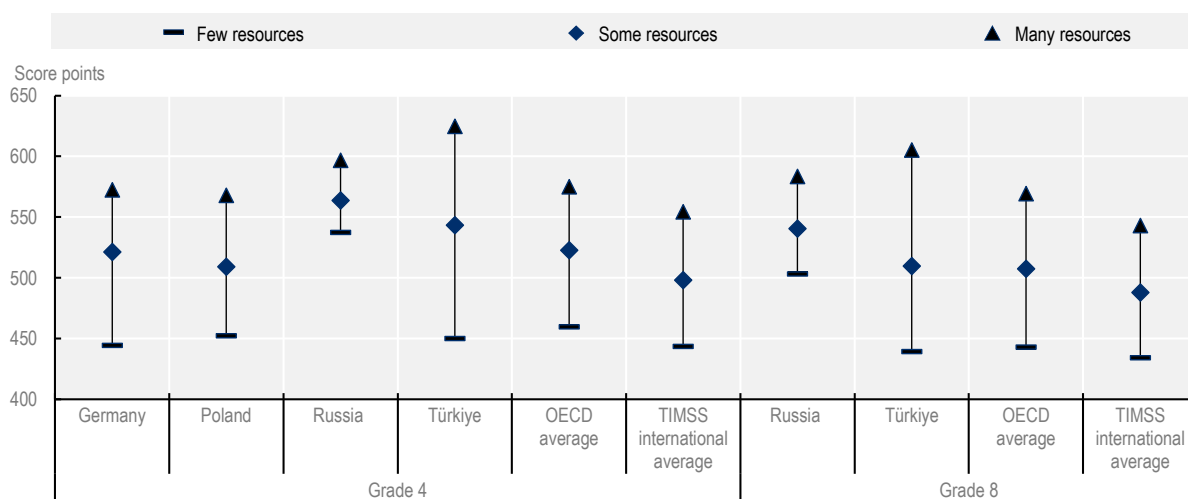
Source: Mullis, I. et al. (2020^[5]), *Highlights - TIMSS 2019 International Results in Mathematics and Science*, <https://timss2019.org/reports/> (accessed on 24 July 2021); OECD (2019^[11]), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, PISA, OECD Publishing, Paris, <https://dx.doi.org/10.1787/b5fd1b8f-en>.

Comparing the performance of students from similar socio-economic backgrounds internationally

Given the significant differences in the socio-economic status across countries – and particularly in Türkiye compared with other OECD countries – it is important to account for these variations when comparing the performance of students across countries (Özer and Suna, 2021^[6]). By looking at the performance of students from the same socio-economic background, one can compare how students with similar backgrounds perform across countries.

In Grades 4 and 8 according to TIMSS, students in Türkiye with the least resources at home perform at similar levels as students with the same background in other OECD and TIMSS-participating countries². In contrast, students with some or many resources at home perform significantly above students from similar backgrounds (Figure 3.5). Equally, according to the PISA data, students from all socio-economic backgrounds perform above the OECD average for 15-year-olds from similar backgrounds (Figure 3.6). Students from the lowest socio-economic group perform particularly well, with the highest score across all OECD countries. Only in some of the highest performing PISA countries – Macao (China), Hong Kong (China) and Beijing, Shanghai, Jiangsu and Zhejiang (China) – do students from this group perform higher (OECD, 2019^[1]).

Figure 3.5. Average performance by level of resources in mathematics in Grades 4 and 8, TIMSS 2019



Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

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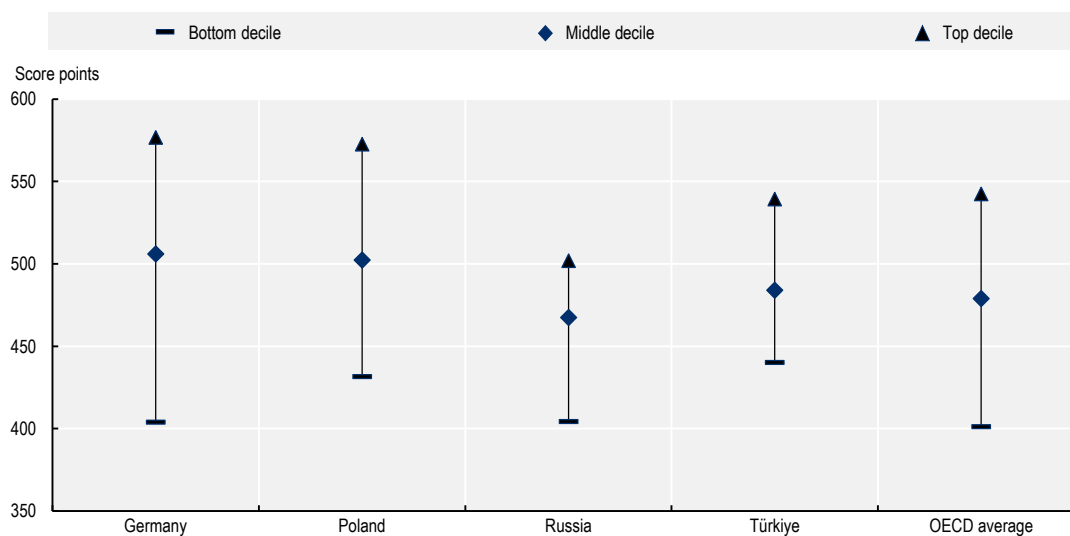
It is important to note that the data in Figure 3.6 do not take into account the actual distribution of students. Since Türkiye has a large share of students from more disadvantaged backgrounds (Figures 3.3 and 3.4), the country's actual average performance on PISA and TIMSS is lower than the average of OECD countries (see Chapter 2). Also, the international deciles of socio-economic status may not be sufficiently subtle to detect the different levels of status at the bottom of the index in Türkiye. The bottom decile of the international index may group together students from different backgrounds domestically.

Nevertheless, one interpretation of these data may be that Türkiye's education system is effective at educating students from lower socio-economic groups. This is reflected in the high share of resilient students (resilient students are students from disadvantaged backgrounds that perform in the top quarter of the country's performers) in Türkiye. Türkiye has the highest share (11.3%) of resilient students across OECD countries, after Estonia (OECD, 2019^[1]).


However, at this level of education, it is also important to take into account Türkiye's coverage index in PISA. The coverage index measures the proportion of the national population of 15-year-olds who are represented by the PISA sample (and should not be confused with national enrolment in upper secondary education, see Chapter 1).³ Türkiye has a coverage index of 0.73, which is the lowest among OECD countries with the exceptions of Colombia, Costa Rica and Mexico (OECD, 2019^[1]). The relatively low coverage index in Türkiye is likely related to students who are excluded from the PISA assessment, remain

out-of-school or attend open high schools, which are not covered by the PISA assessment since they do not attend physical schools (see Chapter 1). It might be the case that 15-year-olds with higher performance are more likely to remain in physical schools (since one of the reasons that a student might attend an open high school is failing to pass two school years)⁴ and therefore would be covered by PISA (OECD, 2019_[11]).

Figure 3.6. Average performance in reading by international decile of socio-economic status, PISA 2018



Source: OECD (2021_[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

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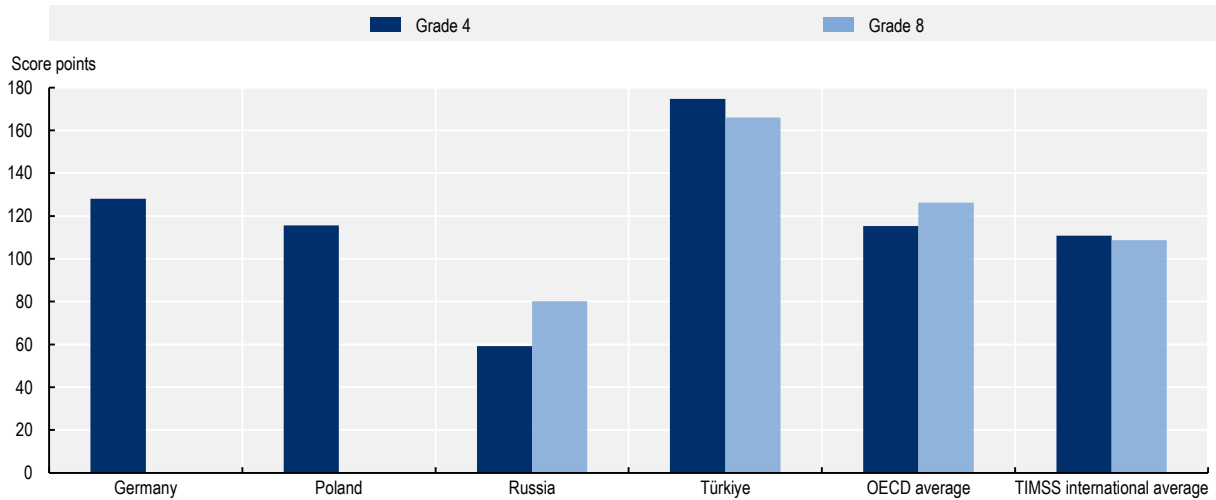
Comparing the difference in performance between advantaged and disadvantaged students

According to the data in Figures 3.7, 3.8 and 3.9, the performance difference between advantaged and disadvantaged students appears to fall as children progress through school, perhaps suggesting that school has an equalising effect and is a driver of equity in Türkiye. According to data from TIMSS, the performance difference between advantaged and disadvantaged students in mathematics and science in Grade 4 in Türkiye is the highest across all OECD-participating countries. However, the performance difference falls by 10 points in mathematics and 12 points in science between Grades 4 and 8 in Türkiye, while the difference increases on average across OECD countries (Figures 3.7 and 3.8). By Grade 8, three OECD countries – Hungary, New Zealand and Sweden – also have greater performance differences between advantaged and disadvantaged students than Türkiye. According to the PISA data in Figure 3.9, this trend appears to continue into upper secondary school. At 15 years of age, the difference in performance in reading across advantaged and disadvantaged 15-year-olds in Türkiye is slightly below the OECD average (Figure 3.9).

There are a number of reasons why the performance difference related to socio-economic background might fall as students move through school in Türkiye. One is the high level of variation in socio-economic background in Grade 4 students which might be associated with high variations in performance. Another is that the Turkish school system is driving more equitable outcomes since once children are in school, access to learning opportunities becomes more equitable (see Chapter 4). As noted above, a greater understanding of the characteristics and performance of students not covered by the PISA assessment at

15 years of age is important to understand the associations between student background and performance in Türkiye in upper secondary school.⁵

Figure 3.7. Difference in performance between students with “many” and “few” resources in mathematics in Grades 4 and 8, TIMSS 2019

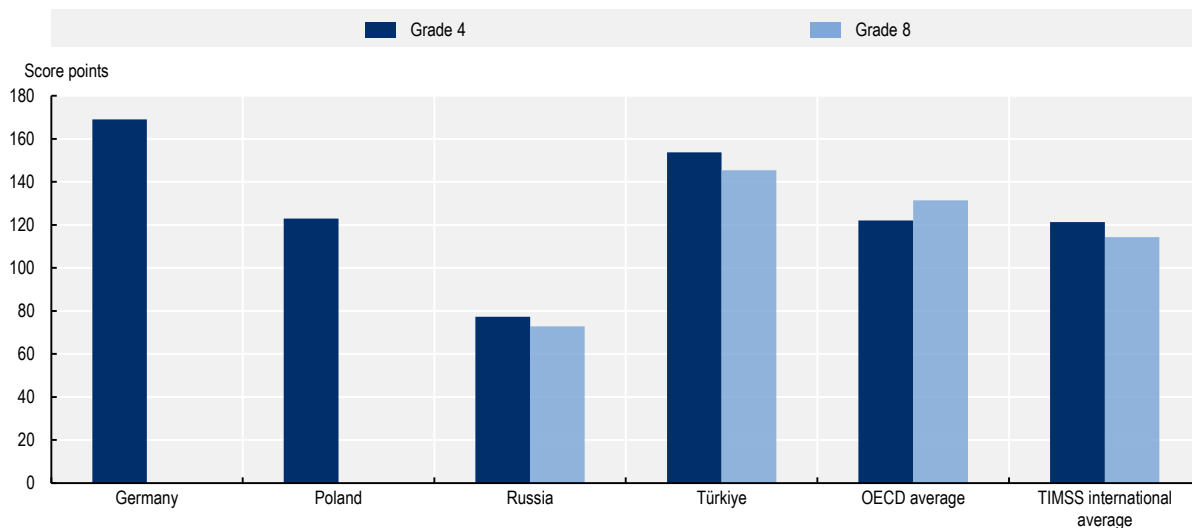


Note: The bar for each country shows the score point difference between students with “many” resources and those with “few resources”.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

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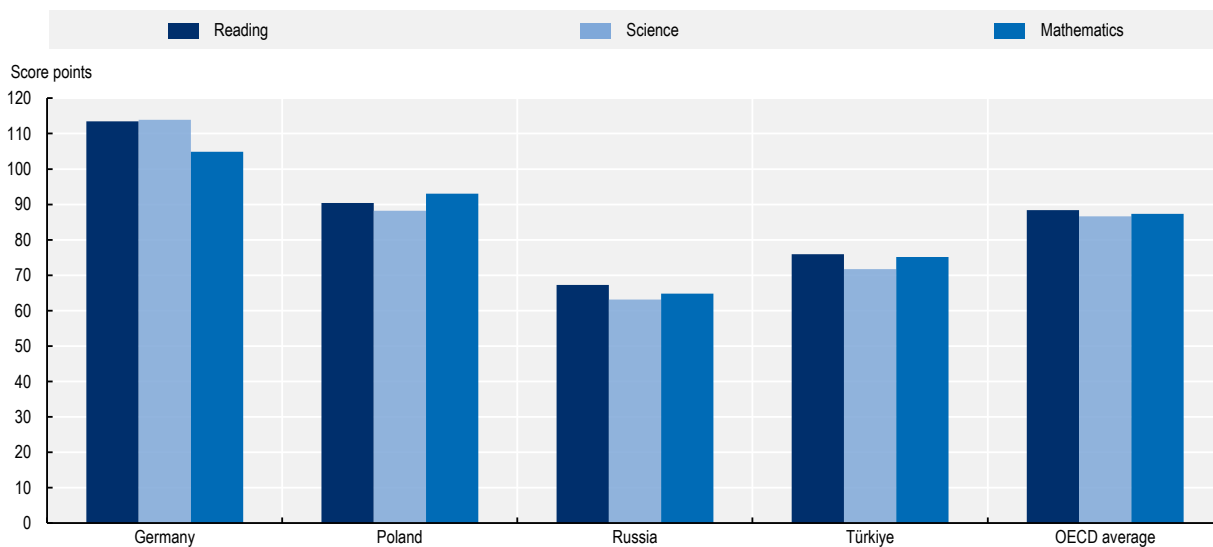
Figure 3.8. Difference in performance between students with “many” and “few” resources in science in Grades 4 and 8, TIMSS 2019



Note: The bar for each country shows the score point difference between students with “many” resources and those with “few resources”.
 Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

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Figure 3.9. Difference in performance between top and bottom socio-economic groups in reading, science and maths, science, PISA 2018



Note: The bar for each country shows the score point difference between students at the top and bottom socio-economic groups.
 Source: OECD (2021^[4]), “PISA: Programme for International Student Assessment”, <https://dx.doi.org/10.1787/data-00365-en>.

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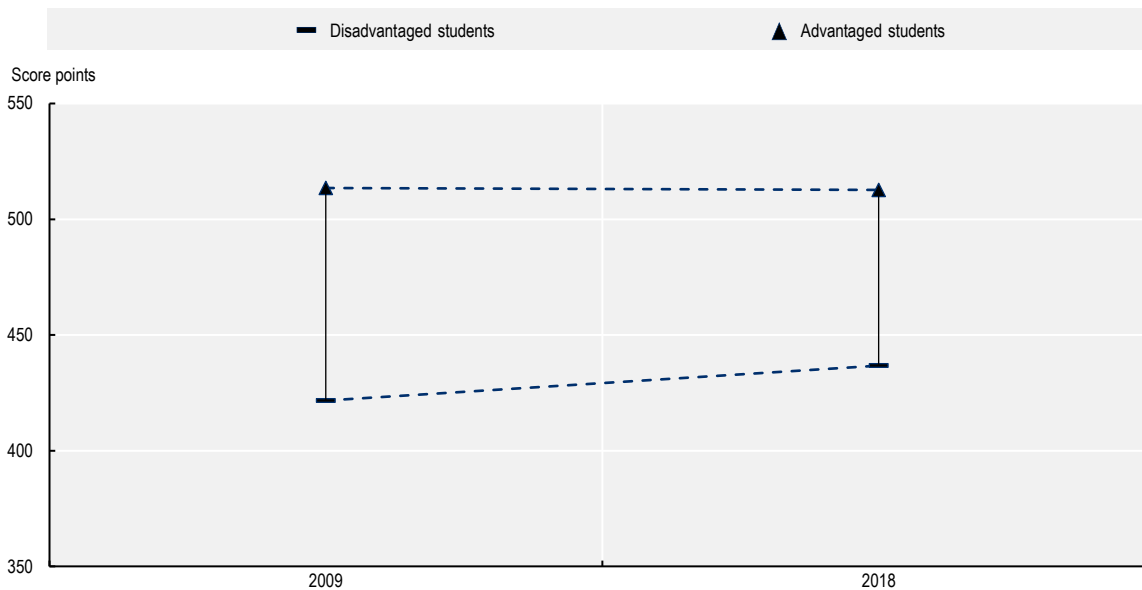
Expanding participation and socio-economic background

In most countries, out-of-school students tend to be from more disadvantaged backgrounds (UIS/UNICEF, n.d.^[7]). As education systems expand, with previously out-of-school students moving into the school system, average results in a country may be affected since the incoming students are likely to have lower levels of performance (Ward, 2020^[8]). However, in Türkiye, as Chapter 2 shows, the average score of students in Türkiye has not fallen as the coverage index has increased.

As well as assuming that the new students who entered the system as coverage expanded were lower performing, it is also a plausible assumption that they were from more disadvantaged backgrounds – especially relative to the other students already in the system. Looking at the average performance of disadvantaged and advantaged students over PISA cycles, there has been a significant increase in the scores for disadvantaged students by 15 points between 2009 and 2018 and an even greater increase of 32 points in mathematics between 2003 and 2012 (Figures 3.10 and 3.11). In contrast, the performance of the advantaged students as remained relatively stable. This suggests that not only has Türkiye been able to rapidly expand its education system over the past two decades but it has also been able to significantly improve the learning outcomes of the previously out-of-school students who now remain in school longer.

Part of the explanation for how this was achieved may relate to the profile of the 15-year-olds who joined the system. The Ministry has enacted a series of policies and initiatives to expand access to education, notably among girls and students from more disadvantaged backgrounds (Suna and Özer, 2022^[9]) (Özer, 2022^[10]). The share of the girls in the system increased (girls represented 45% of the 15-year-olds in PISA in 2003 and 49.6% in 2018) and girls in Türkiye outperformed boys in 2 out of 3 PISA domains (reading and science) (OECD, 2019^[11]). Equally, while it tends to be the most disadvantaged adolescents who are out of school, in 2003, the share of in-school 15-year-olds was so low – with only around a third of students eligible for the PISA assessment – that some of the new students who have since joined the system must have come from middle socio-economic backgrounds. Other policies such as increasing the number of classrooms, increasing teacher numbers and transportation services for students living in remote areas may also have contributed to improvements in quality and access.

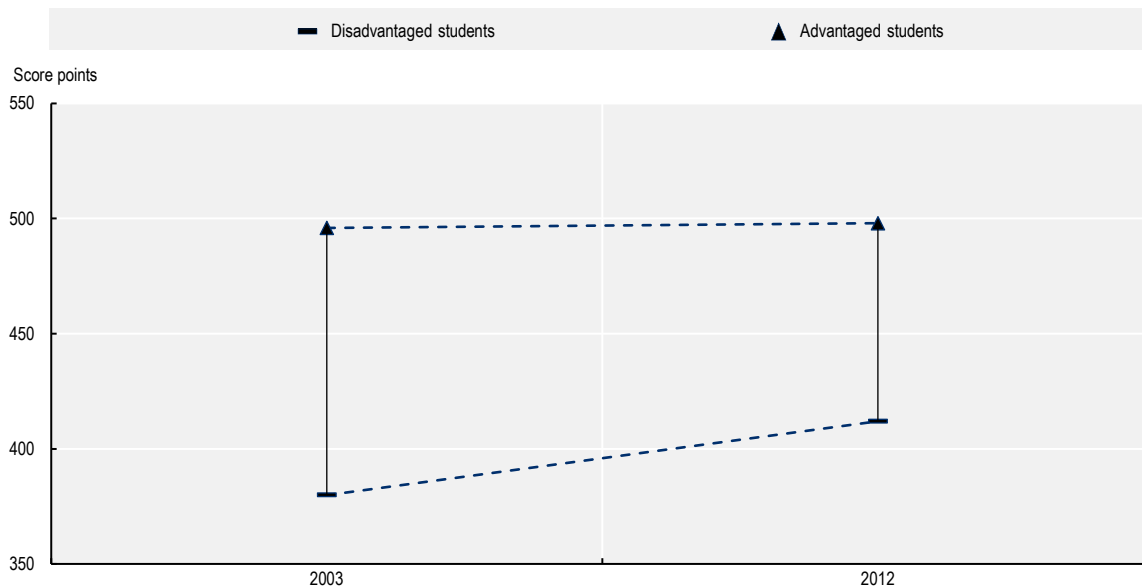
Figure 3.10. Average performance in reading of top and bottom socio-economic groups, PISA 2009 and 2018



Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

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Figure 3.11. Average performance in mathematics of top and bottom socio-economic groups, PISA 2003 and 2012



Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

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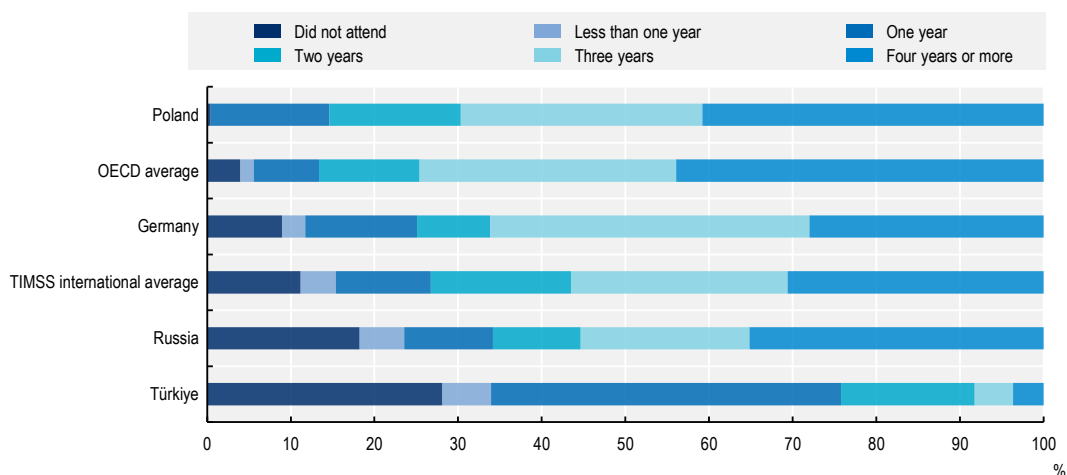
Early childhood education and care (ECEC) participation

Participation in ECEC

This section presents data from PISA and TIMSS about ECEC. It should be noted that both PISA and TIMSS measure participation in ECEC retrospectively. In the case of TIMSS, this means approximately 5 years prior to the 2019 assessment when the cohort of Grade 4 students were of ECEC age and in the case of PISA, approximately 10 years prior to the 2018 assessment, when the current cohort of 15-year-olds were of ECEC age.

In Türkiye, children start primary school at 5.5 years. ECEC (ISCED 0) covers the period before school begins.⁶ According to TIMSS and PISA historic data, in the past, children in Türkiye were less likely to participate in ECEC than in many OECD countries and when children in Türkiye did participate in ECEC, it tended to be for less time. TIMSS 2019 data showed that 34% of children in Grade 4 in Türkiye did not attend ECEC or attended for less than 1 year, compared to only 6% of children on average across OECD countries (Figure 3.12). Evidence shows that the longer ECEC participation is, the greater the positive impact on students' performance (up to three to four years of participation) (OECD, 2021^[12]). In Türkiye, among those who attended ECEC, only 8% attended for 3 years or more compared to 56% on average across OECD countries (Figure 3.12). According to the PISA data, a slightly higher share of students (37%) did not participate in ECEC or participated for less than 1 year (Figure 3.13).

Figure 3.12. ECEC attendance Grade 4, TIMSS 2019



Notes: For the purpose of this report, responses to the PISA and TIMSS questionnaires were harmonised to have the same categories of participation.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

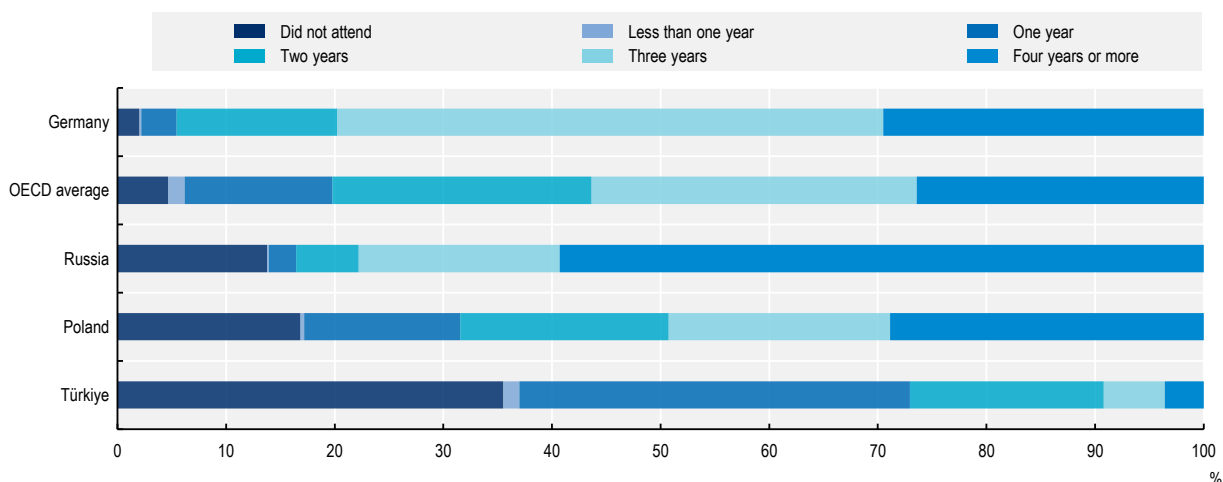
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The difference in ECEC attendance across the PISA and TIMSS data is likely explained by the age difference of the students taking each assessment. While the students taking the Grade 4 TIMSS assessment were aged around 10 years old and therefore participated in ECEC around 4-5 years ago, the 15-year-olds in the PISA sample participated in ECEC around a decade ago. The difference across the assessments is likely driven by an increase in participation over time. This is also reflected by international data on ECEC participation in Türkiye (OECD, 2020^[13]). While the increase in ECEC attendance in Türkiye over time has been significant, the increase in ECEC attendance in Poland was even bigger, going from

17% of children not attending ECEC or attending for less than 1 year in PISA 2018 to less than 1% in TIMSS 2019. This is also reflected in international enrolment rates of 3-5 year-olds (OECD, 2020^[13]).

In line with TIMSS results, PISA shows that children in Türkiye tended to participate in ECEC for fewer years than in other countries – only 6% of 15-year-olds attended ECEC for at least 3 years compared to 30% on average among OECD countries (Figure 3.13).

Figure 3.13. ECEC attendance, PISA 2018



Notes: For the purpose of this report, responses to the PISA and TIMSS questionnaires were harmonised to have the same categories of participation.

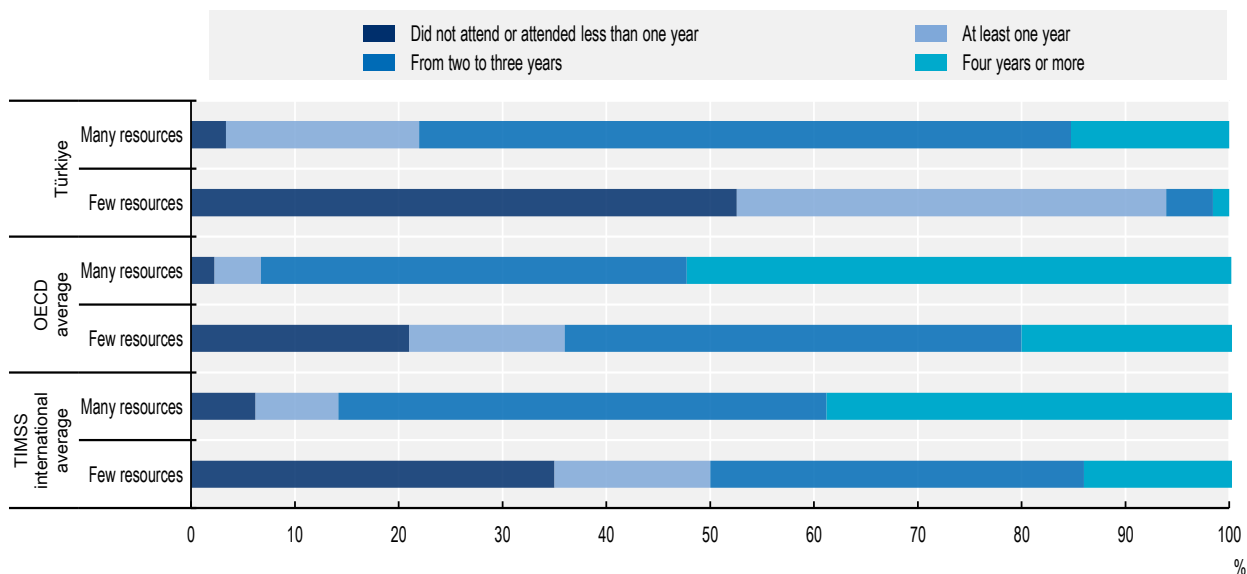
Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

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ECEC attendance and socio-economic status

Research has shown that the benefits of ECEC attendance tend to be greater for socio-economically disadvantaged children (Suziedelyte and Zhu, 2015^[14]). The data from PISA and TIMSS suggest that in the past in Türkiye, there was a strong association between a student's socio-economic background and their participation in ECEC (Suna and Özer, 2022^[9]). Data from both PISA 2018 and TIMSS 2019 show that, in Türkiye, students from disadvantaged backgrounds were far less likely to attend ECEC. According to TIMSS, more than 50% of students with few resources did not participate in ECEC or attended for less than 1 year compared to less than 4% of students with many resources. Students' socio-economic background was also associated with the duration of participation in ECEC. In TIMSS 2019, almost 60% of children with many resources attended ECEC for 2 or 3 years compared to less than 5% of children with few resources (Figure 3.14). In line with TIMSS, PISA data showed that, in Türkiye, 54% of disadvantaged students had not participated in ECEC or attended for less than 1 year compared to only 14% of advantaged students. Moreover, 40% of advantaged students attended ECEC for 2 or 3 years compared to 14% of disadvantaged students (Figure 3.15).

Figure 3.14. Duration of ECEC by socio-economic status, TIMSS 2019

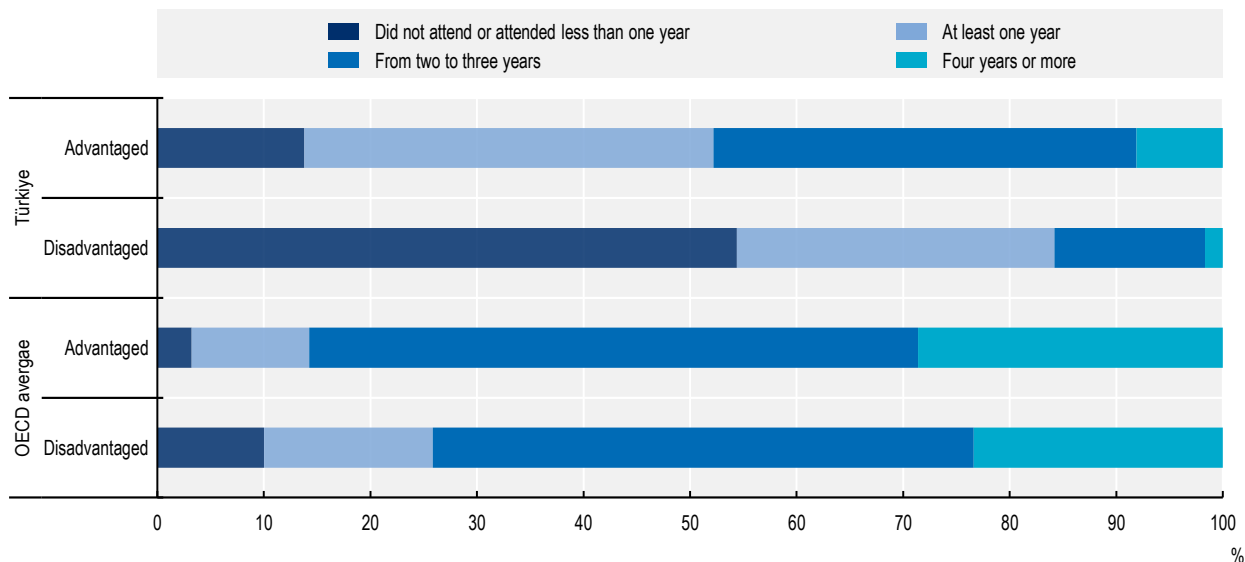


Notes: Shares of students in each category of ECEC attendance are provided in Figure 3.12 and Figure 3.13.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

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Figure 3.15. Duration of ECEC by socio-economic background, PISA 2018



Notes: Shares of students in each category of ECEC attendance are provided in Figure 3.12 and Figure 3.13.

Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

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ECEC attendance and performance

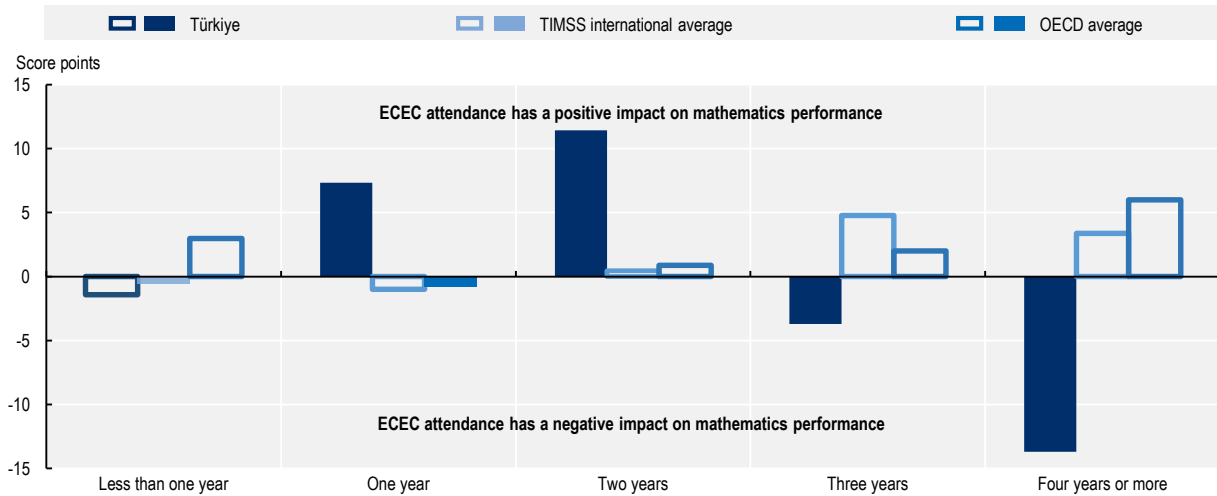
The benefits of ECEC extend well beyond cognitive development into social and emotional skills and labour market participation for mothers (OECD, 2020_[15]). Equally, academic performance is influenced by a wide range of factors, of which prior experience of ECEC might only be one. Looking at the associations between ECEC attendance and school performance, therefore, only provides one aspect of a very large and complex picture on children's development. However, the data from international assessments do provide some insights on how ECEC experiences might be associated with later school performance.

Internationally, attending ECEC is positively associated with performance and this is the case in Türkiye (OECD, 2020_[16]). However, since in many countries, students from advantaged backgrounds are more likely to attend ECEC and for longer periods, part of the positive impact of ECEC is associated with students' socio-economic background (OECD, 2021_[12]). Across all OECD countries, accounting for students' socio-economic status results in the benefits in performance associated with ECEC attendance falling (Balladares and Kankaraš, 2015_[17]). However, data from PISA and TIMSS show that in Türkiye in the past, after accounting for students' and schools' socio-economic status, ECEC was positively associated with reading performance only when children attended ECEC for one year in PISA and one and two years in TIMSS (Figures 3.16 and 3.17).

The PISA and TIMSS data do not provide insights as to why ECEC appeared to have a negative impact on performance once socio-economic status is accounted for in the past. However, one possible explanation is the quality of ECEC programmes in Türkiye, although neither the PISA nor TIMSS data can provide any information about ECEC quality. The fact that ECEC programmes appear to have a positive impact for longer in the more recent TIMSS data (Figure 3.16) might suggest that quality is improving. Evidence suggests that the long-term positive effect of ECEC attendance on cognitive skills is strongly dependent not only on the duration of attendance but also on the quality of the programme (OECD, 2021_[12]).

Figure 3.16. ECEC attendance and performance in mathematics after accounting for socio-economic status, TIMSS 2019

Change in mathematics performance for every extra year of ECEC attendance (compared to not attending ECEC) after accounting for students' and schools' socio-economic status



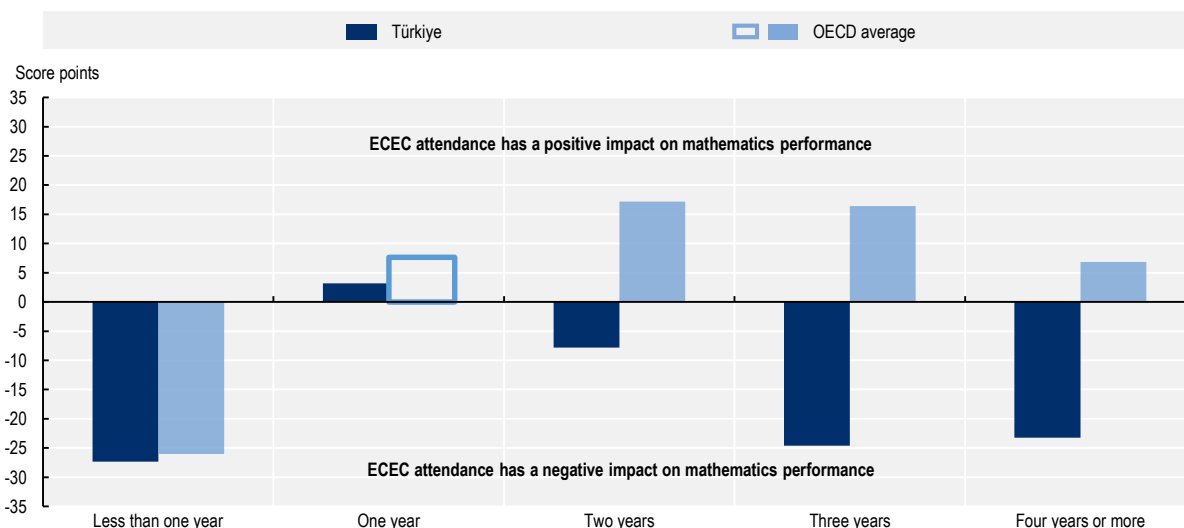
Note: The regression controls for students' and schools' socio-economic status to avoid an upward bias since this is positively correlated to both ECEC attendance and students' performance. Fully coloured bars represent results that are statistically significant at 95% level of significance while bars with a coloured border represent results that were not found to be statistically significant. Shares of students in each category of ECEC attendance are provided in Figure 3.12 and Figure 3.13.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

StatLink  <https://stat.link/wmo532>

Figure 3.17. ECEC attendance and performance in reading after accounting for socio-economic status, PISA 2018

Change in reading performance for every extra year of ECEC attendance (compared to not attending ECEC) after accounting for students' and schools' socio-economic status



Note: The regression controls for students' and schools' socio-economic status to avoid an upward bias since this is positively correlated to both ECEC attendance and students' performance. Fully coloured bars represent results that are statistically significant at 95% level of significance while bars with a coloured border represent results that were not found to be statistically significant. Shares of students in each category of ECEC attendance are provided in Figure 3.12 and Figure 3.13.

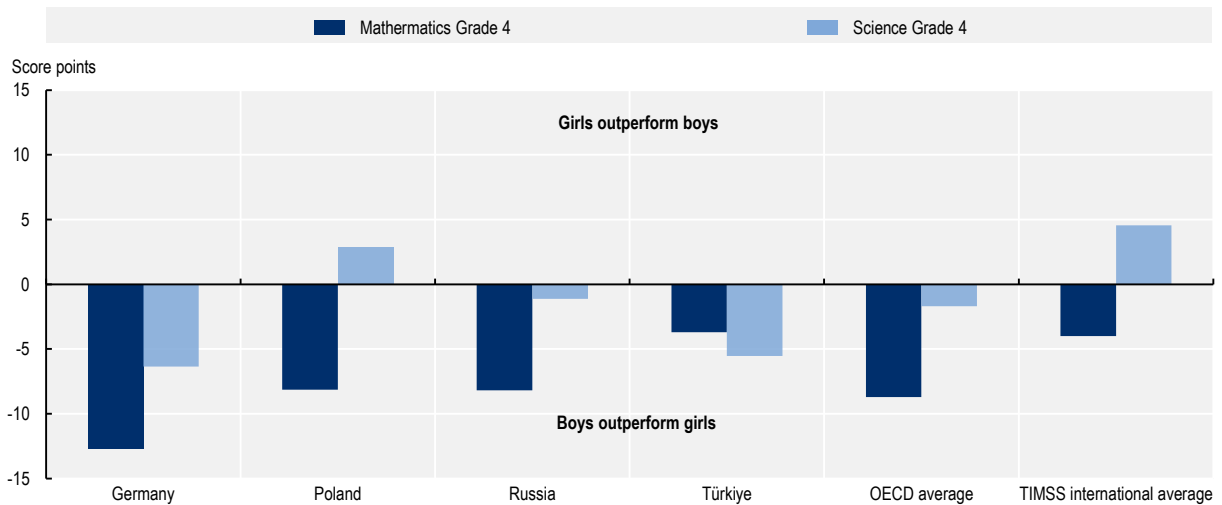
Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

StatLink  <https://stat.link/9irz3f>

Gender

According to TIMSS, in Grade 4, boys outperform girls in Türkiye in both mathematics and science (Figure 3.18). There is a similar pattern of performance in many OECD and some TIMSS countries suggesting that the reasons young girls have lower performance than boys in these subjects might not be specific to Türkiye. By Grade 8, girls in Türkiye outperform boys in mathematics and science (Figure 3.19). While the gender gap narrows in most countries as children move through school, the improvement in girls' performance in Türkiye is particularly marked by Grade 8.

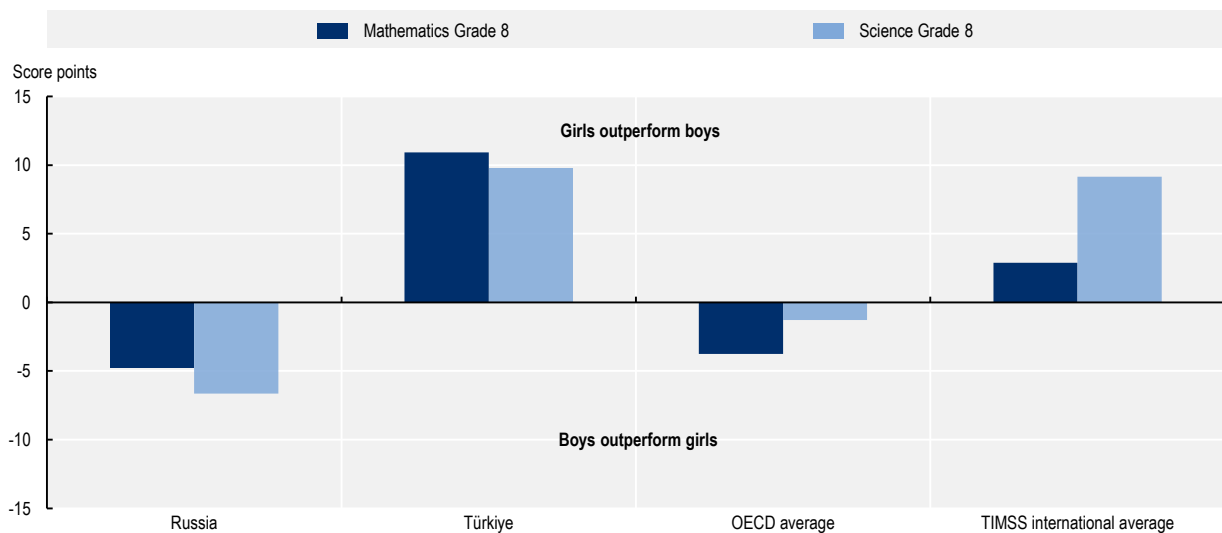
Figure 3.18. Performance by gender in Grade 4, TIMSS 2019



Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

StatLink  <https://stat.link/dh84y5>

Figure 3.19. Performance by gender in Grade 8, TIMSS 2019



Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

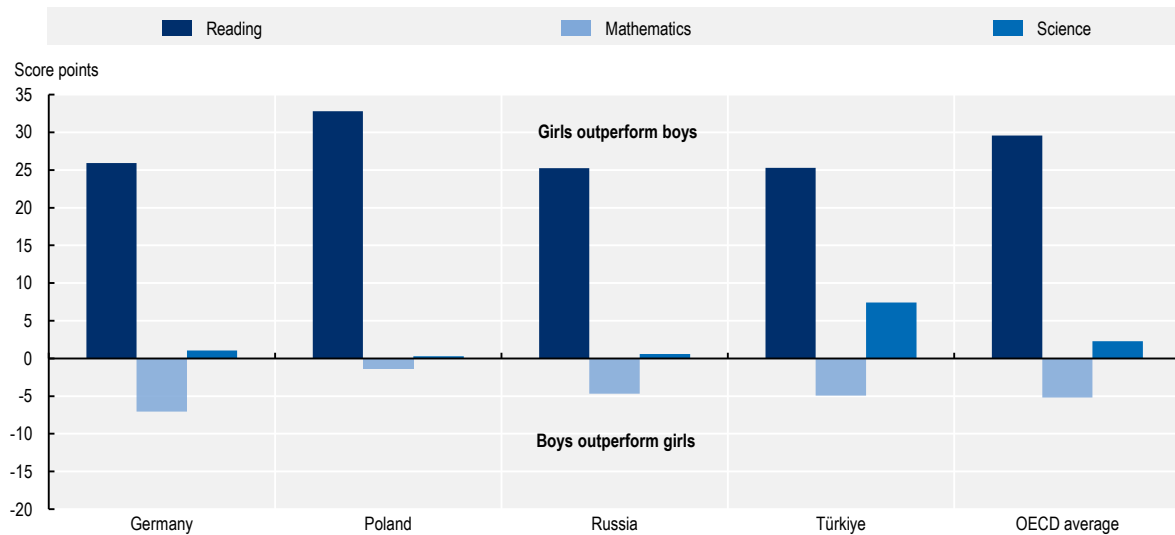
StatLink  <https://stat.link/tyhbmK>

At 15-years-old, according to PISA, girls in Türkiye outperform boys in reading while boys slightly outperform girls in mathematics with patterns of performance very similar to the OECD average. An exception is science, where the higher performance of girls in Türkiye is more pronounced (Figure 3.20).

The gender distribution of in-school and out-of-school students may also be impacting student performance in Türkiye. The first time that Türkiye participated in PISA in 2003, girls were underrepresented, presenting only 45% of the PISA sample (which is designed to be representative of the overall in-school student

population). The share of 15-year-old girls has progressively increased over PISA cycles, to reach 49.6% in PISA 2018 (OECD, 2019^[2]). Since girls in Türkiye outperform boys in reading and science at 15 years of age (and in mathematics and science in Grade 8), this partly explains the rise in both participation and performance in Türkiye in recent decades.

Figure 3.20. Performance by gender at 15 years of age, PISA 2018



Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

StatLink  <https://stat.link/08luir>

Student language

TIMSS and PISA provide data on the share and performance of students who speak the language of the test at home, which is Turkish in the case of Türkiye. The vast majority of students in Türkiye throughout schooling always or almost always speak Turkish at home (Table 3.1). The share of students who do not speak Turkish at home declines throughout schooling to just 7% for 15-year-olds, as measured by PISA.

Table 3.1. Share of students who speak the language of test at home, TIMSS 2019 and PISA 2018

		Always or almost always speak the language of the test at home* (%)	Sometimes or never speak the language of the test at home (%)
Grade 4, TIMSS	Türkiye	86	14
	OECD average	85	15
	TIMSS international average	77	23
Grade 8, TIMSS	Türkiye	88	12
	OECD average	93	7
	TIMSS international average	81	19
15-year-olds, PISA	Türkiye	93	7
	OECD average	88	12

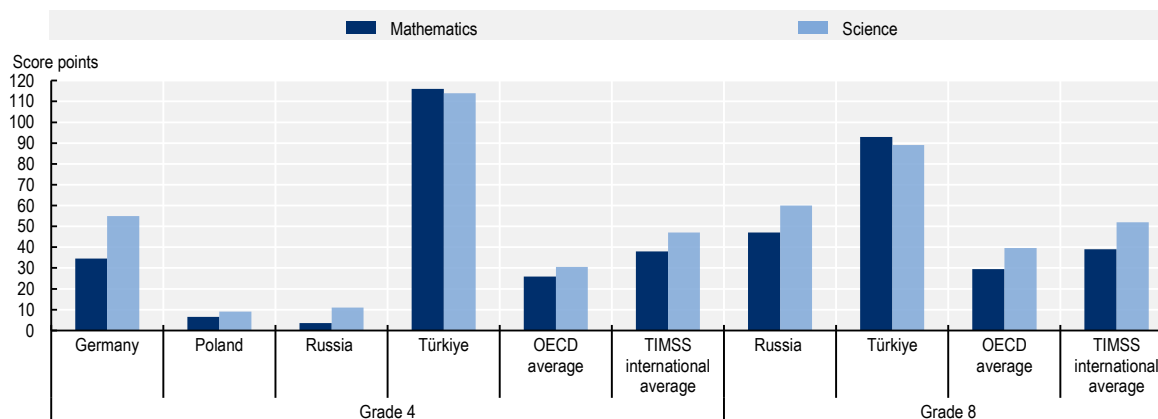
Note: * The four categories were merged into two to make interpretation easier. TIMSS asks students in both Grade 4 and 8 how often they speak the language of the test at home. The variable includes the following categories: “always,” “almost always,” “sometimes,” or “never” speak the language of the TIMSS test at home.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021); OECD (2021^[4]), “PISA: Programme for International Student Assessment”, <https://dx.doi.org/10.1787/data-00365-en>.

While the vast majority of students regularly speak Turkish at home, those who do not have far lower performance in Grades 4 and 8 (Figure 3.21). However, the performance difference declines as children move through school, which perhaps reflects the equalising impact of school in Türkiye, with school attendance particularly benefitting those students who have fewer opportunities to regularly speak Turkish at home.

Figure 3.21. Performance difference by language spoken at home, TIMSS 2019

Performance difference in score points between students who always or almost always speak the language of the test at home and those who sometimes or never speak the language of the test at home



Note: The bar for each country shows the score point difference between students who speak the language of the test at home and those who sometimes or never speak the language of the test at home.

Source: IEA (2020^[3]), *TIMSS 2019 International Results in Mathematics and Science*, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021).

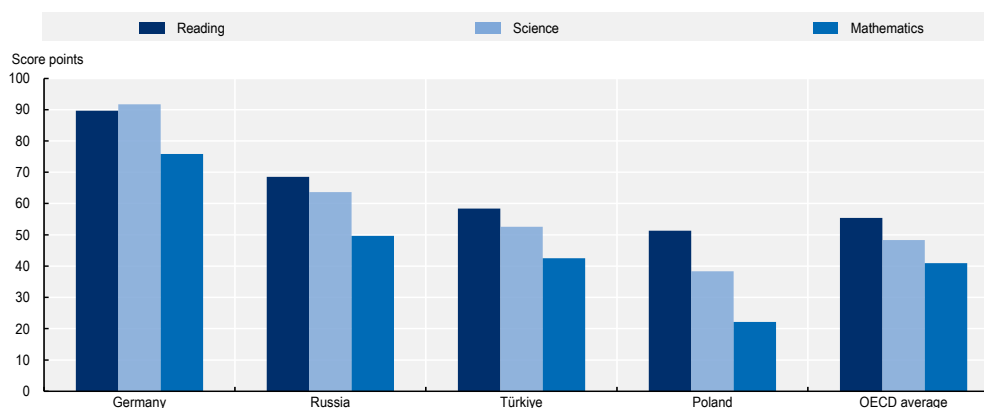
StatLink  <https://stat.link/x3yg60>

At 15-years-old, the difference between students who speak Turkish at home and those who do not is similar to the OECD average (Figure 3.22). One possible explanation for the apparent decline in the impact

of not speaking Turkish at home is that school continues to have an equalising effect. It is also possible that some of these students may move into groups of students that are not sampled by PISA.


Figure 3.22. Performance difference by language spoken at home, PISA 2018

Performance difference in score points between students who always or almost always speak the language of the test at home and those who sometimes or never speak the language of the test at home



Note: The bar for each country shows the score point difference between students who speak the language of the test at home and those who sometimes or never speak the language of the test at home.

Source: OECD (2021^[4]), "PISA: Programme for International Student Assessment", <https://dx.doi.org/10.1787/data-00365-en>.

StatLink  <https://stat.link/brzp5a>

Conclusions

In Türkiye, the data from TIMSS show that there are wide inequities across children in Grade 4 and that many children (over 26%) come from disadvantaged backgrounds (i.e. home backgrounds where there are few resources) (Mullis et al., 2020^[5]). While participation in ECEC has increased in recent years, in the past, it has also seemed to play a limited role in driving equity before children start school (Figures 3.16 and 3.17). This might be because mainly advantaged children tended to benefit from ECEC and the impact from ECEC on learning outcomes was limited, once students' socio-economic background is accounted for (Figures 3.16 and 3.17). However, once children are in school, some indicators of equity improve, perhaps suggesting that performance becomes more equitably distributed across different groups of students – by socio-economic background (Figures 3.5 and 3.6) and the language spoken at home (Figures 3.21 and 3.22) – as students move through school. Equity in terms of gender has also improved in Türkiye. The increase in the participation of 15-year-olds has particularly benefitted girls who are no longer underrepresented in the school population. In PISA 2003, girls represented were 45% of the PISA sample (compared to 49.6% in PISA 2018 (OECD, 2019^[11])). The increase in girls as a share of the 15-year-old population, given their higher performance on reading and science in Türkiye, may also be part of the explanation for the rise in both performance and participation at the same time. Other policies and initiatives undertaken over this period, such as expanding access to school for all students and improving school infrastructure also likely contributed to these improvements.

References

- Balladares, J. and M. Kankaraš (2015), “Attendance in early childhood education and care programmes and academic proficiencies at age 15”, *OECD Education Working Papers*, No. 214, OECD Publishing, Paris, <https://doi.org/10.1787/f16c7ae5-en>. [17]
- IEA (2020), *TIMSS 2019 International Results in Mathematics and Science*, <https://timss2019.org/reports/home-contexts/#> (accessed on 6 December 2021). [18]
- IEA (2020), *TIMSS 2019 International Results in Mathematics and Science*, TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College, and International Association for the Evaluation of Educational Achievement, <https://timssandpirls.bc.edu/timss2019/international-results/> (accessed on 21 May 2021). [3]
- Mullis, I. et al. (2020), *Highlights - TIMSS 2019 International Results in Mathematics and Science*, TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College, and International Association for the Evaluation of Educational Achievement, <https://timss2019.org/reports/> (accessed on 24 July 2021). [5]
- OECD (2021), “PISA: Programme for International Student Assessment”, *OECD Education Statistics (database)*, <https://doi.org/10.1787/data-00365-en> (accessed on 21 May 2021). [4]
- OECD (2021), *Starting Strong VI: Supporting Meaningful Interactions in Early Childhood Education and Care*, Starting Strong, OECD Publishing, Paris, <https://doi.org/10.1787/f47a06ae-en>. [12]
- OECD (2020), *Building a High-Quality Early Childhood Education and Care Workforce: Further Results from the Starting Strong Survey 2018*, TALIS, OECD Publishing, Paris, <https://doi.org/10.1787/b90bba3d-en> (accessed on 3 December 2021). [15]
- OECD (2020), *Education at a Glance 2020: OECD Indicators*, OECD Publishing, Paris, <https://doi.org/10.1787/69096873-en>. [13]
- OECD (2020), “Education Policy Outlook in Turkey”, *OECD Education Policy Perspectives*, No. 23, OECD Publishing, Paris, <https://doi.org/10.1787/b7c69f4c-en>. [16]
- OECD (2019), *PISA 2018 Online Education Database*, OECD, Paris, <http://www.oecd.org/pisa/data/>. [11]
- OECD (2019), *PISA 2018 Results (Volume I): What Students Know and Can Do*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/5f07c754-en>. [2]
- OECD (2019), *PISA 2018 Results (Volume II): Where All Students Can Succeed*, PISA, OECD Publishing, Paris, <https://doi.org/10.1787/b5fd1b8f-en>. [1]
- Özer, M. (2022), “School-Based Improvement in VET: “The 1,000 Schools in Vocational Education and Training Project””, *Bartın University Journal of Faculty of Education*, Vol. 11/2, pp. 268-279, <https://doi.org/10.14686/buefad.1096198>. [10]

- Özer, M. and E. Suna (2021), "The Achievement Gap between Schools and Relationship between Achievement and Socioeconomic Status in Turkey", *Journal of Measurement and Evaluation in Education and Psychology*, Vol. 12/1, pp. 54-70, https://www.researchgate.net/publication/350630996_The_Achievement_Gap_between_Schools_and_Relationship_between_Achievement_and_Socioeconomic_Status_in_Turkey (accessed on 18 July 2022). [6]
- Suna, E. and M. Özer (2022), "The Relationship between Preschool Attendance and Academic Achievement and Socio-economic Status in Turkey", *Journal of Measurement and Evaluation in Education and Psychology*, Vol. 13/1, pp. 54-68, <https://doi.org/10.21031/EPOD.1060460>. [9]
- Suziedelyte, A. and A. Zhu (2015), "Does early schooling narrow outcome gaps for advantaged and disadvantaged children?", *Economics of Education Review*, Vol. 45, pp. 76-88. [14]
- UIS/UNICEF (n.d.), *Fixing the Broken Promise of Education for All: Findings from the Global Initiative on Out-of-School Children*, UNESCO Institute for Statistics, Montreal, <https://doi.org/10.15220/978-92-9189-161-0-en>. [7]
- Ward, M. (2020), "PISA for Development: Out-of-school assessment: Results in Focus", *PISA in Focus*, No. 110, OECD Publishing, Paris, <https://doi.org/10.1787/491fb74a-en> (accessed on 24 July 2021). [8]

Notes

¹ In this report, the terminology of “TIMSS Grade 4” is used throughout since this is the official name of the assessment. However, the data refer to Grade 5 students in lower secondary education in Türkiye.

² For consistency across the PISA analysis and in line with the OECD’s standard practice for comparative analysis, an average of TIMSS-participating countries (“TIMSS international average”) and OECD countries that participate in TIMSS (“OECD average”) are used throughout this report.

³ The PISA coverage index is the proportion of 15-year-olds in a country or economy that were covered by the PISA sample (OECD, 2019^[2]). The difference between the PISA coverage index for Türkiye (73% in 2018) and the enrolment rate for 15-year-olds in 2018 (92%) in Türkiye is because of a number of factors including excluded students (5.66%) and students attending open high schools.

⁴ Reasons for attending an open high school include: being over 18 years which means that students can no longer enrol in physical high schools; students who are required to repeat a grade more than once; students who are suspended from physical high schools; and married students.

⁵ The PISA coverage index is the proportion of 15-year-olds in a country or economy that were covered by the PISA sample (OECD, 2019^[2]). The difference between the PISA coverage index for Türkiye (73% in 2018) and the enrolment rate for 15-year-olds in 2018 (92%) in Türkiye is because of a number of factors including excluded students (5.66%) and students attending open high schools.

⁶ Early childhood education and care (International Standard Classification of Education [ISCED] 01) in Türkiye covers children between 0 and 68 months old. Families seeking care services can send their children to nurseries and day-care centres functioning under the Ministry of Family and Social Services, all of which are private. Early childhood education or pre-school education (ISCED 02) covers children between 36 and 68 months old. Children in this age group go to public and private formal education establishments affiliated to the Ministry of National Education or institutions affiliated to the Ministry of Family and Social Services.



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